NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

SPRING DEVELOPMENT
(no.)
CODE 574

DEFINITION

Improving springs and seeps by excavating, cleaning, capping, or providing collection and storage facilities.

SCOPE

This standard applies to springs and seeps developed as a source of water. It does not apply to Troughs or Tanks (614) or to Pipelines (516).

PURPOSE

Mainly to improve the distribution of water or to increase the quantity of water for livestock or wildlife. Also to obtain water for irrigation if water is available in a suitable quantity and quality.

CONDITIONS WHERE PRACTICE APPLIES

Developments shall be confined to springs or seepage areas that can furnish a dependable supply of suitable water during the planned period or periods of use.

The need for and feasibility of protection from flooding, sedimentation, and contamination shall be considered in determining the suitability of a site for development

DESIGN CRITERIA

Fracture and tubular springs. If water issues from rock fractures, the individual openings shall be cleaned and enlarged, as needed, to provide an increase in flow. The water from these individual openings shall be collected and conveyed to a central sump or spring box by means of tile or perforated pipeline or by a gravel-filled ditch. The collection works shall be constructed an adequate distance below the elevation of the openings to permit free discharge.

If water issues from single opening, such as a solution channel in a soluble rock formation or a tunnel in lava, the opening shall be cleaned or enlarged as needed. A collection system usually is not required, but a spring box or sump shall be installed at an elevation sufficiently low that water will not pond over the spring opening to a depth that will materially reduce the yield.

Perched or contact springs. Perched or contact springs occur where an impermeable layer outcrops beneath a water-bearing permeable layer. These springs shall be developed by intercepting and collecting the flow from the water-bearing formation. Collection trenches shall be used for developing these types of springs.

Artesian springs. Artesian springs shall be developed by removing obstructions, cleaning or enlarging joints or fractures, or by lowering the outlet elevation. Sumps and spring boxes shall be located so as to hold ponding over the spring outlet to a minimum.

Collection systems. If a collecting trench along the outcrop of the water-bearing formation is to be used, the trench shall be excavated so that it extends into the impervious layer.

An impervious cutoff wall of well-tamped clay, masonary, concrete or other suitable materials

shall be constructed along the downstream side of the trench if needed to insure that the flow enters the collection system.

The collection system shall consist of subsurface drainage tubing or perforated pipe not less than 3 in. in diameter, or a wood box drain enclosed in a sand-gravel filter. A crushed rock or gravel backfill, not less than 12 in. deep, may be used instead of these types of drains.

Spring boxes. Spring boxes, if needed, shall be of durable material and shall have a tight, removable cover. The boxes shall have a minimum cross-sectional area of 1-1/2 ft^2. The floor of the spring box shall be not less than 6 in. below the outlet of the collection system. Spring boxes for perched springs shall be floored with concrete unless the underlying material is solid rock or other stable impervious material.

Spring boxes that can be contaminated by livestock shall be fenced. Surface runoff shall be diverted from the spring box to prevent entry into the water system.

Outlets. The outlet pipe from a spring box shall be placed not less than 6 in. above the floor of the box to provide a sediment trap. However, the outlet must not be so high as to cause a head on the spring that can reduce flow. The outlet pipe shall be installed so as to insure a watertight connection with the spring box. The inlet of the pipe will be covered with a suitable screen to prevent clogging from organic trash, gravel, or small reptiles. The screen should be mesh type with openings ¼ to ½ of the diameter of the pipe. The inlet of the pipe will be covered with suitable screen to prevent clogging. The outlet pipe shall have a minimum diameter of 1 inch. The pipe shall meet the requirements of Standard 516 Pipeline. Water from the spring box shall be conveyed to a permanent type tank or trough which meets Sevice standards. The tank or trough shall meet the requirements of Standard 614 Trough or Tank.

Measures required to protect the development from damage by freezing, flooding, sedimentation, contamination, and livestock shall be included in the design.

PLANNING CONSIDERATIONS

Water Quantity

Potential changes in surface water quantity, especially base flow. Factor is the removal of obstructions and vegetation in the spring area.

Water Quality

Potential temporary degradation of water quality caused by erosion and sedimentation from the area disturbed during construction.

PLANS AND SPECIFICATIONS

Plans and specifications for installing spring developments shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose.

SPRING DEVELOPMENT SPECIFICATIONS

All loose rock, sediment, encrustations, logs and vegetation that can obstruct the free discharge of the spring shall be removed and disposed of so that they will not endanger the spring development.

Collection trenches, drain tiles, perforated pipe lines, sumps, and spring boxes shall be constructed to the elevation and grade shown on the plans.

Crushed rock or gravel for collection systems and sand-gravel material for filters shall be composed of clean hard particles.

All materials used will be in good condition and meet the requirements of the applicable ASTM specifications or commercial standards.

SPRING DEVELOPMENT OPERATION AND MAINTENANCE

This spring development was designed and installed to collect and discharge water for beneficial use. The estimated life span of this installation is at least 10 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program. This practice will require periodic operation and maintenance to maintain satisfactory performance.

Maintain all fences in good condition to exclude livestock from collection and storage systems.

Maintain covers and seals to prevent insects and rodents from contact with the waste.

Maintain all screens and filters in good working condition, replace if damaged.

Precaution and care is needed to prevent herbicides, insecticides, and other pollutants from contamination of the water.

Limit the use of any fertilizer in the watershed area.

Protect system and components from damage by freezing.

Immediately repair any vandalism. Vehicular, or livestock damage.